

CLAIMS

What is claimed is:

1. An authenticatable article comprising:
 - a printable surface;
 - a latent image formed on a first portion of the printable surface in a transmittent printing medium, the latent image being an encoded version of an authentication image and being configured for optical decoding by an optical decoder so that the authentication image can be viewed through the optical decoder when the optical decoder is placed over the latent image.
2. An authenticatable article according to claim 1 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being no greater than 5% of the reflectivity of the adjacent area.
3. An authenticatable article according to claim 1 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being in a range of about 0.5% to about 1.5% of the reflectivity of the adjacent area.
4. An authenticatable article according to claim 1 wherein the transmittent printing medium comprises a clear printer's varnish.
5. An authenticatable article according to claim 1 wherein the transmittent printing medium includes one or more of a dye and an iridescent material.

6. An authenticatable article according to claim 1 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 150 lines/inch.
7. An authenticatable article according to claim 1 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 65 lines/inch.
8. An authenticatable article according to claim 1 wherein the line frequency is selected to match a lens frequency of the decoder within about plus or minus 10 lines/inch.
9. An authenticatable article according to claim 1 further comprising a visible primary image formed on a second portion of the printable surface.
10. An authenticatable article according to claim 9 wherein at least a portion of the latent image is formed over at least a portion of the primary image.
11. An authenticatable article according to claim 10 wherein a maximum reflectivity difference between the at least a portion of the latent image and the at least a portion of the primary image is no greater than 5% of the reflectivity of the at least a portion of the primary image.
12. An authenticatable article according to claim 10 wherein a maximum reflectivity difference between the at least a portion of the latent image and the at least a portion of the primary image is in a range of about 0.5% to about 1.5% of the reflectivity of the at least a portion of the primary image.
13. A system for authenticating an article, the system comprising:
 - a latent image formed in a transmittent printing medium on a printable surface of the article, the latent image being configured as an encoded version of an authentication image using an optically decodable coding scheme; and
 - an optical decoder comprising a lens adapted for placement over at least a portion of the latent image, the lens having optical decoding properties corresponding to the

optically decodable coding scheme for decoding the latent image when the lens is placed over the latent image, thereby allowing the authentication image to be viewed through the lens.

14. A system for authenticating an article according to claim 13 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being no greater than 5% of the reflectivity of the adjacent area.

15. A system for authenticating an article according to claim 13 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being in a range of about 0.5% to about 1.5% of the reflectivity of the adjacent area.

16. A system for authenticating an article according to claim 13 wherein the transmittent printing medium comprises a clear printer's varnish.

17. A system for authenticating an article according to claim 13 wherein the transmittent printing medium comprises a clear printer's varnish and one or more of a dye and an iridescent material.

18. A system for authenticating an article according to claim 13 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 150 lines/inch.

19. A system for authenticating an article according to claim 13 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 65 lines/inch.

20. A system for authenticating an article according to claim 19 wherein the lens is a lenticular lens formed as a substantially planar member having an upper, viewer-facing surface and a lower, image-facing surface, the viewer-facing surface having a plurality of adjacent parallel ridges having a common geometry including a curved uppermost surface having a predetermined curvature, the number and geometry of the parallel ridges establishing a lens frequency.
21. A system for authenticating an article according to claim 20 wherein the line frequency and the lens frequency differ by less than about 10 lines/inch.
22. A system for authenticating an article according to claim 19 wherein the lens comprises an anti-reflective coating on at least one of the upper, viewer-facing surface and the lower, image-facing surface.
23. A system for authenticating an article according to claim 22 wherein the anti-reflective coating comprises a magnesium fluoride coating.
24. A system for authenticating an article according to claim 22 wherein the anti-reflective coating comprises at least one of a narrowband coating and a broadband coating.
25. A system for authenticating an article according to claim 22 wherein the anti-reflective coating is formed from a plurality of layers.
26. A system for authenticating an article according to claim 22 wherein the anti-reflective coating has a total thickness in a range of about 2.0 microns to about 4.0 microns.
27. A system for authenticating an article, the system comprising:
 - a latent image formed in a transmittent printing medium on a printable surface of the article, the latent image being configured as an encoded version of an authentication image using an optically decodable coding scheme; and
 - optical decoding means for decoding the latent image so that the authentication image can be viewed.

28. A system for authenticating an article according to claim 27 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being no greater than 5% of the reflectivity of the adjacent area.

29. A system for authenticating an article according to claim 27 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being in a range of about 0.5% to about 1.5% of the reflectivity of the adjacent area.

30. A system for authenticating an article according to claim 27 wherein the transmittent printing medium comprises a clear printer's varnish.

31. A system for authenticating an article according to claim 27 wherein the transmittent printing medium comprises a clear printer's varnish and one or more of a dye and an iridescent material.

32. A system for authenticating an article according to claim 27 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 150 lines/inch.

33. A system for authenticating an article according to claim 27 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 65 lines/inch.

34. A system for authenticating an article according to claim 27 wherein the optical decoding means includes a lenticular lens formed as a substantially planar member having an upper, viewer-facing surface and a lower, image-facing surface, the viewer-facing surface having a plurality of adjacent parallel ridges having a common geometry including a curved uppermost

surface having a predetermined curvature, the number and geometry of the parallel ridges establishing a lens frequency.

35. A system for authenticating an article according to claim 34 wherein the line frequency and the lens frequency differ by less than about 10 lines/inch.

36. A system for authenticating an article according to claim 34 wherein the lenticular lens comprises an anti-reflective coating on at least one of the upper, viewer-facing surface and the lower, image-facing surface.

37. A system for authenticating an article according to claim 36 wherein the anti-reflective coating comprises a magnesium fluoride coating.

38. A system for authenticating an article according to claim 36 wherein the anti-reflective coating comprises at least one of a narrowband coating and a broadband coating.

39. A system for authenticating an article according to claim 36 wherein the anti-reflective coating is formed from a plurality of layers.

40. A system for authenticating an article according to claim 36 wherein the anti-reflective coating has a total thickness in a range of about 2.0 microns to about 4.0 microns.

41. A method of applying an authentication image to an article, the method comprising:
obtaining a digitized version of the authentication image;
encoding the digitized version of the authentication image to produce an encoded latent image; and
printing the encoded latent image on a first portion of the printable surface of the article using a transmittent printing medium.

42. A method of applying an authentication image to an article according to claim 41 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an

adjacent area of the printable surface, the maximum reflectivity difference being no greater than 5% of the reflectivity of the adjacent area.

43. A method of applying an authentication image to an article according to claim 41 wherein the transmittent printing medium is selected to provide a maximum reflectivity difference between the first portion of the printable surface with the latent image printed thereon and an adjacent area of the printable surface, the maximum reflectivity difference being in a range of about 0.5% to about 1.5% of the reflectivity of the adjacent area.

44. A method of applying an authentication image to an article according to claim 41 wherein the transmittent printing medium comprises a clear printer's varnish.

45. A method of applying an authentication image to an article according to claim 41 wherein the transmittent printing medium comprises a clear printer's varnish and one or more of a dye and an iridescent material.

46. A method of applying an authentication image to an article according to claim 41 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 150 lines/inch.

47. A method of applying an authentication image to an article according to claim 41 wherein the latent image comprises a plurality of parallel lines printed with a line frequency in a range of about 50 lines/inch to about 65 lines/inch.

48. A method of applying an authentication image to an article according to claim 41 wherein the article includes a visible primary image disposed on the printable surface and the action of printing the encoded latent image includes printing at least a portion of the encoded latent image over at least a portion of the primary image.

49. A method of applying an authentication image to an article according to claim 48 wherein a maximum reflectivity difference between the at least a portion of the encoded latent image and

the at least a portion of the primary image is no greater than 5% of the reflectivity of the at least a portion of the primary image.

50. A method of applying an authentication image to an article according to claim 48 wherein a maximum reflectivity difference between the at least a portion of the encoded latent image and the at least a portion of the primary image is in a range of about 0.5% to about 1.5% of the reflectivity of the at least a portion of the primary image.

51. A method of applying an authentication image to an article according to claim 41 wherein the action of printing the encoded latent image is carried out using a lithographic printing apparatus.

52. A method of applying an authentication image to an article according to claim 41 wherein the action of obtaining a digitized version of the authentication image comprises:

selecting the authentication image; and
digitizing the authentication image.

53. A method of applying an authentication image to an article according to claim 41 wherein the action of encoding the digitized version of the authentication image comprises breaking down the digitized version of the authentication image into equally spaced parallel lines having a predetermined frequency.

54. A method of applying an authentication image to an article according to claim 53 wherein the predetermined frequency is in a range from about 50 lines per inch to about 150 lines per inch.

55. A method of applying an authentication image to an article according to claim 41 wherein the action of encoding the digitized version of the authentication image is carried out by a digital processing system programmed to encode the digitized version of the authentication image according to an encryption methodology that provides for optically decoding the encoded latent image when the encoded latent image is printed on an article.